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A hernia is formed by the protrusion of certain abdominal organs through an acquired or congenital opening in the abdominal wall. The hernia always has three constituents present which include the hernial ring; the hernial sac which is composed of the peritoneum; and hernial contents which may include a loop of intestine or a portion of the uterus, stomach or omentum. According to their location, hernias are classified as umbilical, inguinal, scrotal, ventral, peritoneal or diaphragmatic.

The technique for repairing an umbilical hernia in swine is relatively simple, and many veterinarians have found that the surgery is more successful in smaller pigs. In larger pigs the hernial ring is often quite large with a concurrent weakness of the surrounding abdominal wall.

In the pre-operative procedure, it is best if the pigs are starved for twenty-four hours prior to the operation. The operative area is prepared by shaving, scrubbing and applying an antiseptic such as a 70% alcohol solution. A local anesthetic is then injected into the skin around the intended lines of incision.

An elliptical skin incision is made over the fundus of the sac. The incision should include any excess skin which is to be removed along with any abscesses or ulcerative conditions that may be present. In male pigs the initial technique is slightly different because the prepuce and preputial opening are usually at the umbilical area. Thus, these structures must be reflected. A V-shaped incision is made through the skin with the two incisions meeting anterior to the preputial orifice. The prepuce and preputial sac are then reflected to one side and the rest of the operation can be performed. The preputial diverticulum should not be incised when making the skin incision or reflecting the prepuce.

Blunt dissection is used to clear the area until the thickened peritoneal hernial sac is reached. It is grasped with the fingers or forceps and the dissection is continued until the muscle layers of the hernial ring are reached. The muscle layers of the abdominal wall are exposed for 1 or 2 inches around the hernial sac.

An open or closed method of repair may now be employed. The peritoneal hernial sac is pushed back into the abdominal cavity in the closed method. Overlapping sutures of nylon or vetafil are used to close the hernial ring. Continuous subcuticular sutures are placed and the skin is sutured with nylon. The peritoneal hernial sac is incised in the open method. It is not incised at the ventral-most point because small abscesss are often present. The adhesions are broken down and the hernial contents are replaced. The peritoneal hernial sac is removed and overlapping sutures are used to close the hernial ring. Subcuticular sutures are placed and the skin is sutured with nylon.

Quite frequently in pigs an abscess occurs on the peritoneal portion of the hernial sac. The abscess can usually be removed without rupturing if the operator is careful. One method that can be used is described by Guard. After the sac is isolated the hernial ring is completely obliterated by several mattress sutures. The hernial sac which contains the abscess is then removed close to the line of sutures. The remaining muscle layers and fascia are sutured in such a manner as to completely bury the stump of the hernial sac. Continuous sutures are used and this is followed by suturing the skin with nylon.

Some veterinarians have used a relatively new method to repair those umbili-

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cal hernias that are difficult to repair due to an excessively large ring. It consists of using some type of stainless steel or plastic mesh to replace the defect in the body wall. The usual procedure of dissection is used. After the peritoneal cavity is entered, the mesh is placed beneath the peritoneum, the viscera being in contact with the mesh. Mattress type sutures are placed in the mesh prior to placing the mesh in the peritoneal cavity. The sutures in the mesh are then placed through the peritoneal and muscle walls. Subcuticular sutures are placed and the skin is sutured with nylon.

In small pigs with a very small umbilical hernia, a blister such as a 7% iodine solution, a mild acid or mercuric iodine is often placed on the umbilicus. This will set up an acute inflammatory reaction which will often produce enough connective tissue to close the hernia. Sterile saline solution or a counter-irritant such as hypodermin may be injected into the hernial ring and also cause enough of a response to close the ring.

REFERENCES

1. Frank, E. R. Veterinary Surgery. Burgess Publishing Co. 6th ed. pg. 233–236.
2. Guard, W. F. Umbilical Hernia in The Pig. Veterinary Practitioners' Bulletin Vol. XXII July 4, 1923.

METHODS OF INJECTING Tuberculin in cattle. The effect of three methods — superficial intradermic, deep intradermic and thrust — of injecting tuberculin has been studied in tests carried out on the caudal folds and neck regions of two groups of cattle. One group was sensitized by means of heat-killed *Mycobacterium tuberculosis* var. *bovis* and the second by heat-killed *Mycobacterium paratuberculosis*.

On the caudal folds there were no significant differences observed in the results by the three methods of injection. On the neck, however, the two intradermic methods gave significantly larger reactions than the thrust. The deep intradermic injection gave the largest reaction.

The effect of the site of injection on the neck was also studied and it was found that, in general, the lower front sites gave the largest reaction.

Larsen, A. B., Baisden, L. A., Merkal, R. S. and Morris, M. J. Methods of injecting tuberculin in cattle. Am. Jour .of Vet. Res. 18:546–549. July, 1957.

Book Review

HOW TO WRITE SCIENTIFIC AND TECHNICAL PAPERS

This volume is an outgrowth of two earlier books: *"Preparation of Scientific and Technical Papers"* and *"The Scientific Paper, How to Prepare it, How to Write It."*

The book deals with all the factors necessary in the preparation of technical papers. Topics which are beyond the scope of the book are treated lightly, then the author suggests references for those who find it necessary to study the particular topic more thoroughly.

It briefly covers the choosing of a research problem, use of libraries and guides to the literature. There is a short section on statistical methods and the reliability of measurements. The writing and arrangement of the subject matter is well covered. Methods are suggested which will help make the paper more interesting. For those who are preparing a manuscript to be published, the correct method of preparing copy and estimating the length of the printed material is given. Only a few rules of grammar and rhetoric are included. Considerable detail is given on how to prepare and present organized data in the form of tables. Technics are given on the preparation of graphs, drawings and photographs for the paper.

This book will be a valuable aid for students and research workers who are preparing illustrated papers, scientific reports, or manuscripts for publication in journals.

How to Write Scientific and Technical Papers. By Sam F. Trelease. 815 pages. Williams and Wilkins Co., Mount Royal and Guilford Aves., Baltimore 2, Md. 1958. Price $3.25.